CLAIMS

1. A DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:143, 145, 147, 149, 151, 153, 155, 157, 168, 170 and 172.

2. A shear stress-responsive DNA capable of hybridizing with a DNA having the nucleotide sequences represented by SEQ ID NO:143, 145, 149, 151, 153, 155, 157, 168, 170 or 172 under stringent conditions.

3. A shear stress-responsive DNA capable of hybridizing with a DNA having the nucleotide sequence represented by SEQ ID NO:147 under stringent conditions, and having not less than 90% homology with the DNA.

4. A DNA having the same sequence as 5 to 60 consecutive bases in a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:143, 145, 149, 153, 155, 157, 168, 170 and 172, or a DNA having a sequence complementary to the DNA.

5. A method for detecting an mRNA for a shear stress-responsive gene using a DNA according to any one of claims 1 to 4.

6. A diagnostic method for vascular diseases caused by arteriosclerosis which comprises using a DNA according to any one of claims 1 to 4.

7. A method for detecting a gene causative of arteriosclerosis using a DNA according to any one of claims 1 to 4.

8. A method for screening an agent for regulating the transcription or translation of a shear stress-responsive gene using a DNA according to any one of claims 1 to 4.

9. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis using a DNA according to any one of claims 1 to 4.

10. A method for treating vascular diseases caused by arteriosclerosis which comprises using a DNA according to any one of claims 1 to 4.

11. A recombinant virus vector containing a DNA according to any one of claims 1 to 4.

12. A recombinant virus vector containing an RNA comprising a sequence homologous with the sense strand of a DNA according to any one of claims 1 to 4.

13. A DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:111, 113, 115, 116, 117, 119, 121, 123, 125, 127, 129, 130, 131, 132, 133, 134, 135, 137, 139 and 141.

14. A shear stress-responsive DNA capable of hybridizing with the DNA according to claim 13 under stringent conditions.

15. A DNA having the same sequence as 5 to 60 consecutive bases in a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:111, 113, 115, 116, 117, 119, 121, 123, 125, 127, 129, 130, 131, 132, 133, 134, 135, 137, 139 and 141, or a DNA having a sequence complementary to the DNA.

16. A diagnostic method for vascular diseases caused by arteriosclerosis which comprises using a DNA according to any one of claims 13 to 15.

17. A method for detecting a gene causative of arteriosclerosis using a DNA according to any one of claims 13 to 15.

18. A method for screening an agent for regulating the transcription or translation of a shear stress-responsive gene using a DNA according to any one of claims 13 to 15.

19. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis using a DNA according to any one of claims 13 to 15.

20. A method for detecting an mRNA for a shear stress-responsive gene using a DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 and 109.

21. A method for identifying the apoptosis sensitivity of cells by detecting the endogenous transcription level of a DNA having the nucleotide sequence represented by SEQ ID NO:7 using a DNA having the nucleotide sequence represented by SEQ ID NO:7 or a DNA having the same sequence as 5 to 60 consecutive bases in the nucleotide

sequence represented by SEQ ID NO:7.

22. A method for suppressing or promoting the apoptosis of cells by regulating the endogenous transcription or translation of a DNA having the nucleotide sequence represented by SEQ ID NO:7 using a DNA having the nucleotide sequence represented by SEQ ID NO:7 or a DNA having the same sequence as 5 to 60 consecutive bases in the nucleotide sequence represented by SEQ ID NO:7, or an antisense DNA having a nucleotide sequence complementary to the nucleotide sequence of each of these DNAs.

23. A diagnostic method for vascular diseases caused by arteriosclerosis which comprises using a DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 and 109.

24. A method for identifying the apoptosis sensitivity of cells which comprises using a DNA having the nucleotide sequence represented by SEQ ID NO:7, or a DNA having the same sequence as 5 to 60 consecutive bases in the nucleotide sequence represented by SEQ ID NO:7.

25. A method for screening an agent for regulating the transcription or translation of a shear stress-responsive gene using a DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 and 109.

26. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis using a DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 and 109.

27. A method for screening an agent for suppressing or promoting the apoptosis of cells by regulating the endogenous transcription or translation of a DNA

having the nucleotide sequence represented by SEQ ID NO:7 using a DNA having the nucleotide sequence represented by SEQ ID NO:7 or a DNA having the same sequence as 5 to 60 consecutive bases in the nucleotide sequence represented by SEQ ID NO:7.

28. A method for treating vascular diseases caused by arteriosclerosis which comprises using a DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 and 109.

29. A method for suppressing or promoting the apoptosis of cells which comprises using a DNA having the nucleotide sequence represented by SEQ ID NO:7 or a DNA having the same sequence as 5 to 60 consecutive bases in the nucleotide sequence represented by SEQ ID NO:7, or an antisense DNA having a nucleotide sequence complementary to the nucleotide sequence of each of these DNAs.

30. A recombinant virus vector containing a DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 and 109.

31. A recombinant virus vector containing an RNA comprising a sequence homologous with the sense strand of a DNA having a nucleotide sequence selected from the nucleotide sequences represented by SEQ ID NO:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99, 101, 103, 105, 107 and 109.

32. A method for treating vascular diseases caused by arteriosclerosis which comprises using a recombinant virus vector according to claim 30 or 31.

33. A method for suppressing the apoptosis of cells using a recombinant virus vector containing a DNA having the nucleotide sequence represented by SEQ ID NO:7, or a recombinant virus vector containing an RNA comprising a sequence homologous with the sense strand of a DNA having the nucleotide sequence represented by SEQ ID

NO:7.

34. A method for screening an agent for suppressing or promoting the apoptosis of cells using a recombinant virus vector containing a DNA having the nucleotide sequence represented by SEQ ID NO:7, or a recombinant virus vector containing an RNA comprising a sequence homologous with the sense strand of a DNA having the nucleotide sequence represented by SEQ ID NO:7.

35. A protein having an amino acid sequence selected from the amino acid sequences represented by SEQ ID NO:144, 146, 148, 150, 152, 154, 156, 158, 169, 171 and 173.

36. A protein comprising an amino acid sequence in which one or more amino acids are deleted, replaced or added as compared with the amino acid sequence possessed by the protein according to claim 35, and having an activity participating in the formation of an arteriosclerotic lesion.

37. A DNA encoding a protein according to claim 35 or 36.

38. A recombinant DNA obtained by inserting a DNA according to any one of claims 1-4 and 37 into a vector.

39. A transformant obtained by introducing the recombinant DNA according to claim 38 into a host cell.

40. A process for the preparation of a protein which comprises culturing the transformant according to claim 39 in a culture medium, causing a protein according to claim 35 or 36 to be produced and accumulated in the culture medium, and harvesting the protein from the resulting culture.

41. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis which comprises culturing the transformant according to claim 39 in a culture medium and using the resulting culture for the screening.

42. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis using a protein according to claim 35 or 36.

43. A recombinant virus vector capable of producing a protein according to claim 35 or 36.

44. A method for treating vascular diseases caused by arteriosclerosis which comprises using the recombinant virus vector of claim 43.

45. An antibody capable of recognizing a protein according to claim 35 or 36.

46. A method for detecting a protein according to claim 35 or 36 immunologically using the antibody according to claim 45.

47. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis using the antibody according to claim 45.

48. A method for screening an agent for regulating the transcription or translation of a shear stress-responsive gene using the antibody according to claim 45.

49. A diagnostic method for vascular diseases caused by arteriosclerosis which comprises using the antibody according to claim 45.

50. A method for treating vascular diseases caused by arteriosclerosis which comprises using the antibody according to claim 45.

51. A drug delivery method which comprises combining the antibody of claim 45 with a radioactive isotope, a protein or a low-molecular-weight agent, and delivering the resulting conjugated antibody to an arteriosclerotic lesion.

52. An antibody capable of recognizing a protein having an amino acid sequence represented by SEQ ID NO:112, 114, 118, 120, 122, 124, 126, 128, 136, 138, 140 and 142.

53. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis using the antibody according to claim 52.

54. A method for screening an agent for suppressing the transcription or translation of a shear stress-responsive gene using the antibody according to claim 52.

55. A diagnostic method for vascular diseases caused by arteriosclerosis which comprises using the antibody according to claim 52.

56. A method for treating vascular diseases caused by arteriosclerosis which comprises using the antibody according to claim 52.

57. A drug delivery method which comprises combining the antibody of claim 52 with a radioactive isotope, a protein or a low-molecular-weight agent, and delivering

the resulting conjugated antibody to an arteriosclerotic lesion.

58. A method for screening an agent capable of binding specifically to a protein having the amino acid sequence represented by SEQ ID NO:8 and effective for suppressing or promoting the apoptosis of cells, using a protein having the amino acid sequence represented by SEQ ID NO:8.

59. A method for screening an agent for suppressing or promoting the apoptosis of cells which comprises inserting a DNA having the nucleotide sequence represented by SEQ ID NO:7 or a DNA encoding a protein having the amino acid sequence represented by SEQ ID NO:8, into a vector; introducing the resulting recombinant DNA into a host cell; culturing the resulting transformant in a culture medium; and using the resulting culture for the screening.

60. A recombinant virus vector capable of producing a protein having an amino acid sequence selected from the amino acid sequences represented by SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108 and 110.

61. A method for treating vascular diseases caused by arteriosclerosis which comprises using the recombinant virus vector according to claim 60.

62. A method for suppressing the apoptosis of cells using a recombinant virus vector capable of producing a protein having the amino acid sequence represented by SEQ ID NO:8.

63. A method for suppressing the apoptosis of cells which comprises using a recombinant virus vector capable of producing a protein having the amino acid sequence represented by SEQ ID NO:8.

64. A method for screening a therapeutic agent for vascular diseases caused by arteriosclerosis using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108 or 110.

65. A method for screening an agent for suppressing or promoting the transcription or translation of a shear stress-responsive gene using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108 or 110.

66. A method for regulating the apoptosis of cells using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:8.

67. A method for screening an agent for regulating the apoptosis of cells using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:8.

68. A method for identifying the apoptosis sensitivity of cells by detecting the expression level of a protein having the amino acid sequence represented by SEQ ID NO:8 using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:8.

69. A method according to any one of claims 21, 22, 27, 33, 34, 58, 59, 62, 66, 67 and 68 wherein the cells are vascular endothelial cells.

70. A diagnostic method for vascular diseases caused by arteriosclerosis which comprises using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108 or 110.

71. A method for identifying the apoptosis sensitivity of cells which comprises using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:8.

72. A method for treating vascular diseases caused by arteriosclerosis which comprises using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78,

80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108 or 110.

73. A method for regulating the apoptosis of cells which comprises using an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:8.

74. An agent for suppressing or promoting the apoptosis of cells which is obtained by a method according to any one of claims 27, 34, 58, 59 and 67.

75. An agent according to claim 74 wherein the cells are vascular endothelial cells.

76. A method according to any one of claims 24, 29, 63, 71 and 73 wherein the cells are vascular endothelial cells.

77. A drug delivery method which comprises combining an antibody capable of recognizing a protein having the amino acid sequence represented by SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108 or 110, with a radioactive isotope, a protein or a low-molecular-weight agent, and delivering the resulting conjugated antibody to an arteriosclerotic lesion.